Log Event A

Borehole # 21-03-12

Borehole Information

Farm : BX	**Tank :** BX-103	**Site Number :** 299-E33-238
N-Coord : 45,646	**W-Coord :** 53,252	**TOC Elevation :** 653.90
Water Level, ft :	**Date Drilled :** 10/25/1973	

Casing Record

Type : Steel-welded	Thickness, in. : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:

Borehole 21-03-12 was completed in October 1973 to a depth of 100 ft with 6-in. casing. The casing thickness is presumed to be 0.280 in., on the basis of the published thickness for schedule-40, 6-in. steel tubing. A driller's log was not available for this borehole, so data from Chamness and Merz (1993) were used to provide borehole construction information. No information concerning grouting or perforations was available; therefore, it is assumed that the borehole was not grouted or perforated. The top of the casing, which is the zero depth reference for the SGLS, is about 0.5 ft below the ground surface.

Equipment Information

Logging System : 1B	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 02/1997	**Calibration Reference :** GJO-HAN-13	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	06/02/1997	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L **Shield :**	N
Finish Depth, ft. :	17.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	06/03/1997	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	99.0	**Counting Time, sec.:**	100	**L/R :** L **Shield :**	N
Finish Depth, ft. :	25.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	06/03/1997	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	26.0	**Counting Time, sec.:**	100	**L/R :** R **Shield :**	N
Finish Depth, ft. :	20.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

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Log Run Number :	4	**Log Run Date :**	06/03/1997	**Logging Engineer:**	Alan Pearson
Start Depth, ft.:	21.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	16.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Analysis Information

Analyst : D.L. Parker

Data Processing Reference : MAC-VZCP 1.7.9 Analysis Date : 11/12/1997

Analysis Notes :

This borehole was logged by the SGLS in four log runs. The pre-survey and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from the spectra that best matched the data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation. Some fine gain adjustments were necessary during logging of this borehole to ensure correct peak identifications. One log run was performed using real-time measurements because the dead time was greater than 90 percent from about 21 to 25 ft.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclide Cs-137 was detected continuously from the ground surface to 22 ft, continuously from 26 to 32 ft, and at the bottom of the borehole (99 ft). Additional man-made radionuclides may be present in the interval from about 21.5 to 25.5 ft, but no measurements were possible in this interval because of the high dead time. A zone of elevated Cs-137 concentrations was detected from 12 to 18 ft with a maximum Cs-137 concentration of about 3.6 pCi/g at 16.5 ft. The maximum Cs-137 concentration could not be determined because of the zone of high dead time.

The K-40 concentrations increase gradually from 39 to 41 ft from a background of about 13 to about 18 pCi/g.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank BX-103.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

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A plot of the spectrum shape factors is included. The plot is used as an interpretive tool to help determine the radial distribution of man-made contaminants around the borehole. A plot of selected historical gross gamma logs is also included.